

INTEROFFICE CORRESPONDENCE

DATE February 13, 1995

TO L J Peterson-Wright, Operable Units 5, 6, & 7, Building 080, X8553

FROM L Guinn, Environmental Policy & Regulatory Integration, Bldg 080, X8559 *Linda*

SUBJECT REGULATORY ANALYSIS ON THE PERMISSIBILITY OF PLACING OPERABLE UNIT (OU) 7 POND SEDIMENTS UNDER THE LANDFILL SOIL CAP - LG-001-95

DOE Order 4700 1

Action No action required

As we have discussed, I believe that under both the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) it is permissible to place the sediments from the leachate collection ponds under the cap during final closure/remediation. Attached is the logic supporting this belief. I have done the analysis independently for both regulatory schemes. Additionally, I have addressed the Environmental Protection Agency's (EPA's) concern that placement of the sediments under the cap may make the landfill a new unit.

Please recognize that one of the items clarified in the Corrective Action Management Unit (CAMU) rule was the permissibility of consolidating wastes within a CAMU. This part of the federal CAMU rule is not being challenged, although the federal CAMU rule is the subject of current litigation. Even though the OU7 scenario could be easily answered regulatorily using the CAMU rule, the same result can be justified independent of the CAMU rule under the special circumstances of OU7.

I have also attached a couple of the Superfund fact sheets that I have cited within the analysis. If I can further clarify the situation, please do not hesitate to give me a call on extension 8559.

kld

Attachments
As Stated (2)

cc

L A. Gregory-Frost *agf*
ERPD Project File (2)

Facts:

- 1 - The OU7 landfill received RCRA hazardous waste after 1980
- 2 - Disposal of hazardous waste in the OU7 landfill ended in 1986
- 3 - The OU7 landfill was listed in the 1987 Part B as planned to be closed under interim status
- 4 - The landfill was listed in the IAG as a RCRA closure OU
- 5 - The East landfill pond was constructed to receive leachate from the landfill
- 6 - The landfill pond continues to receive leachate and run off from the landfill
- 7 - All contaminants of concern in the landfill pond came from the landfill

RCRA Analysis Assumptions

- 1 A post closure permit will be required for the OU7 landfill and corrective action is required to be addressed

Rationale §270 1(c) *Owners or operators of landfills that received wastes after July 26, 1982, or that certified closure (according to §265 115) after January 26, 1983, must have post-closure permits, unless they demonstrate closure by removal as provided under §270 1(c)(5) and (6) If a post-closure permit is required, the permit must address applicable Part 264 Groundwater Monitoring, Unsaturated Zone Monitoring, Corrective Action, and Post-closure Care Requirements of this chapter (emphasis added)*

- 2 The corrective action provisions require cleanup of releases of hazardous waste or hazardous waste constituents from a solid waste management unit to the environment

Rationale §3004(u) of RCRA *a permit issued after November 8, 1984, by the Administrator or a State shall require, corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage, or disposal facility seeking a permit under this subchapter, regardless of the time at which waste was placed in such unit*

- 3 Placing the sediments from the pond in the landfill is not adding new waste to the landfill It is merely returning the released waste to its original source and capping in place to prevent future migration

Rationale 1) The hazardous constituents in the sediments came from leachate from the landfill Therefore, all the hazardous constituents are "releases" from the waste 2) Sediments from the pond are not wastes, but contaminated environmental media (The "contained in" policy states that environmental media that "contains" a hazardous waste will be managed as a hazardous waste until the hazardous waste can be removed) OSW Memorandum dated 11-13-86 Also See 57 FR 986, CMA v EPA, 869 F 2d 1526 (D C Cir 1989)

- 4 Placing the sediments in the landfill would not make the landfill a new hazardous waste unit

Rationale It could be argued that the pond is part of the landfill because a) it is immediately adjacent to the landfill, b) it was built to collect the landfill leachate and run-off (i.e. it is the landfill's run-off collection system) If the pond area is part of the landfill, then movement of the sediments is merely consolidation of constituents within the same unit Such consolidation under a closure plan would be permissible because it was part of the closure action

Alternative Rationale 1) The landfill is already a hazardous waste management unit (See facts #1 & #2) 2) A hazardous waste landfill may take hazardous waste until it is closed 3) The landfill is under an order on consent to close, so actions taken to meet closure, including corrective action, are legally mandated as part of the final closure (This avoids the problem that this is potentially an unpermitted landfill - it is regulated under the consent order and closure plan) 4) Consolidating the waste back in the landfill (and under the cap) fulfills the requirements of corrective action to be protective of human health and the environment 5) The corrective action is to return the released waste constituents to the original source and would be part of the final closure

- 5 "Placing" the sediments back in the landfill will not be placement in or on the land in violation of LDR

Rationale The concentrations are so low, that LDR treatment standards would be met

- 6 Alternatively, if the sediments were delisted, then putting the sediments under the cap would not be a RCRA concern at all

Rationale See #4 under the CERCLA Analysis

CERCLA Analysis Assumptions:

- 1 The pond is within the "Area of Contamination" (AOC)

Rationale The hazardous waste constituents in the sediments were released from the landfill, therefore, they are within the AOC

Superfund LDR Guide #5 EPA uses the concept of "areas of contamination" (AOCs), which may be viewed as equivalent to RCRA units, for the purposes of LDR applicability determinations An AOC is delineated by the areal extent (or boundary) of contiguous contamination Such contamination must be contiguous, but may contain varying types and concentrations of hazardous substances

Superfund Publication 9347 3-O5FS, July 1989

- 2 Waste may be consolidated within the AOC without triggering LDR

Rationale Superfund LDR Guide #5 *Placement does not occur when wastes are treated in situ, capped in place, consolidated within the AOC, or processed within the AOC (but not in a separate unit, such as a tank) to improve its structural stability (e.g. for capping or to support heavy machinery) In summary, if placement on-site or off-site does not occur, the LDRs are not applicable to the Superfund action (emphasis in original)*

- 3 Even if the waste triggered LDR, the sediments meet the LDR treatment standards

Rationale See #5 under RCRA analysis

- 4 If the sediments are below health based levels (10^{-4}) then the sediments may be delisted in the ROD If delisted, putting the sediments under the cap would merely be adding more soil to the cap

Rationale *Under RCRA, once sufficient data are collected on the waste, and its potential fate and transport, models are run to evaluate the dilution and attenuation of constituents at a hypothetical receptor well The calculated concentration of constituents at the hypothetical receptor well must at least meet the health-based levels used for delisting decisions for the waste to be successfully delisted (Table 1, inserted in {the} fact sheet, contains the maximum allowed concentrations (MACs) for specific constituents based on current health-based levels (10^{-4} risk) developed by the Office of Solid Waste for delisting decisions) Waste to be delisted must be managed as hazardous until it has been analyzed in accordance with the sampling and analysis requirements established at the time of delisting, and it has been determined that delisting levels have been attained*
Superfund Publication 9347 3-09FS, Sept 1990, "A Guide to Delisting of RCRA Wastes for Superfund Remedial Responses"



Superfund LDR Guide #5

Attachment 2

LG-001 95

Page 1 of 10

Determining When Land Disposal Restrictions (LDRs) Are Applicable to CERCLA Response Actions

CERCLA Section 121(d)(2) specifies that on-site Superfund remedial actions shall attain "other Federal standards, requirements, criteria, limitations, or more stringent State requirements that are determined to be legally applicable or relevant and appropriate (ARAR) to the specified circumstances at the site." In addition, the National Contingency Plan (NCP) requires that on-site removal actions attain ARARs to the extent practicable. Off-site removal and remedial actions must comply with legally applicable requirements. This guide outlines the process used to determine whether the Resource Conservation and Recovery Act (RCRA) land disposal restrictions (LDRs) established under the Hazardous and Solid Waste Amendments (HSWA) are 'applicable' to a CERCLA response action. More detailed guidance on Superfund compliance with the LDRs is being prepared by the Office of Solid Waste and Emergency Response (OSWER).

For the LDRs to be applicable to a CERCLA response, the action must constitute placement of a restricted RCRA hazardous waste. Therefore, site managers (OSCs, RPMs) must answer three separate questions to determine if the LDRs are applicable

- (1) Does the response action constitute placement?
- (2) Is the CERCLA substance being placed also a RCRA hazardous waste? and if so
- (3) Is the RCRA waste restricted under the LDRs?

Site managers also must determine if the CERCLA substances are California list wastes, which are a distinct category of RCRA hazardous wastes restricted under the LDRs (see Superfund LDR Guide #2).

(1) DOES THE RESPONSE CONSTITUTE PLACEMENT?

The LDRs place specific restrictions (e.g., treatment of waste to concentration levels) on RCRA hazardous wastes prior to their placement in land disposal units. Therefore, a key determination is whether the response action will constitute placement of wastes into a land disposal unit. As defined by RCRA, land disposal units include landfills, surface impoundments, waste piles, injection wells, land treatment facilities, salt dome formations, underground mines or caves, and concrete bunkers or vaults. If a CERCLA response includes disposal of wastes in any of these types of off-site land disposal units, placement will occur. However, uncontrolled hazardous waste sites often have widespread and dispersed contamination, making the

concept of a RCRA unit less useful for actions involving on-site disposal of wastes. Therefore, to assist in defining when "placement" does and does not occur for CERCLA actions involving on-site disposal of wastes, EPA uses the concept of 'areas of contamination' (AOCs), which may be viewed as equivalent to RCRA units, for the purposes of LDR applicability determinations.

An AOC is delineated by the areal extent (or boundary) of contiguous contamination. Such contamination must be continuous, but may contain varying types and concentrations of hazardous substances. Depending on site characteristics, one or more AOCs may be delineated. Highlight 1 provides some examples of AOCs.

Highlight 1. EXAMPLES OF AREAS OF CONTAMINATION (AOCs)

- A waste source (e.g., waste pit, landfill, waste pile) and the surrounding contaminated soil.
- A waste source, and the sediments in a stream contaminated by the source, where the contamination is continuous from the source to the sediments.*
- Several lagoons separated only by dikes, where the dikes are contaminated and the lagoons share a common liner

* The AOC does not include any contaminated surface or ground water that may be associated with the waste-based waste source.

For on-site disposal, placement occurs when wastes are moved from one AOC (or unit) into another AOC (or unit). Placement does not occur when wastes are left in place, or moved within a single AOC. Highlight 2 provides scenarios of when placement does and does not occur, as defined in the proposed NCP. The Agency is currently reevaluating the definition of placement prior to the promulgation of the final NCP, and therefore, these scenarios are subject to change.

Highlight 2: PLACEMENT

Placement does occur when wastes are.

- Consolidated from different AOCs into a single AOC,
- Moved outside of an AOC (for treatment or storage, for example) and returned to the same or a different AOC, or
- Excavated from an AOC, placed in a separate unit, such as an incinerator or tank that is within the AOC, and redeposited into the same AOC

Placement does not occur when wastes are

- Treated in situ;
- Capped in place,
- Consolidated within the AOC, or
- Processed within the AOC (but not in a separate unit, such as a tank) to improve its structural stability (e.g., for capping or to support heavy machinery)

In summary, if placement on-site or off-site does not occur, the LDRs are not applicable to the Superfund action.

(2) IS THE CERCLA SUBSTANCE A RCRA HAZARDOUS WASTE?

Because a CERCLA response must constitute placement of a restricted RCRA hazardous waste for the LDRs to be applicable, site managers must evaluate whether the contaminants at the CERCLA site are RCRA hazardous wastes. Highlight 3 briefly describes

the two types of RCRA hazardous wastes -- listed and characteristic wastes.

Highlight 3. RCRA HAZARDOUS WASTES

A RCRA solid waste* is hazardous if it is listed or exhibits a hazardous characteristic

Listed RCRA Hazardous Wastes

Any waste listed in Subpart D of 40 CFR 261, including:

- F waste codes (Part 261.31)
- K waste codes (Part 261.32)
- P waste codes (Part 261.33(e))
- U waste codes (Part 261.33(f))

Characteristic RCRA Hazardous Wastes

Any waste exhibiting one of the following characteristics, as defined in 40 CFR 261

- Ignitability
- Corrosivity
- Reactivity
- Extraction Procedure (EP) Toxicity

* A solid waste is any material that is discarded or disposed of (i.e., abandoned, recycled in certain ways or considered inherently waste-like). The waste may be solid, semi-solid, liquid, or a contained gaseous material. Exclusions from the definition (e.g., domestic sewage sludge) appear in 40 CFR 261.4(a). Exemptions (e.g., household wastes) are found in 40 CFR 261.4(b).

Site managers are not required to presume that a CERCLA hazardous substance is a RCRA hazardous waste unless there is affirmative evidence to support such a finding. Site managers, therefore, should use "reasonable efforts" to determine whether a substance is a RCRA listed or characteristic waste. (Current data collection efforts during CERCLA removal and

remedial site investigations should be sufficient for this purpose.) For listed hazardous wastes, if manifests or labels are not available, this evaluation likely will require fairly specific information about the waste (e.g., source, prior use, process type) that is "reasonably ascertainable" within the scope of a Superfund investigation. Such information may be obtained from facility business records or from an examination of the processes used at the facility. For characteristic wastes, site managers may rely on the results of the tests described in 40 CFR 261.21 - 261.24 for each characteristic or on knowledge of the properties of the substance. Site managers should work with Regional RCRA staff, Regional Counsel, State RCRA staff, and Superfund enforcement personnel, as appropriate, in making these determinations.

In addition to understanding the two categories of RCRA hazardous wastes, site managers will also need to understand the derived-from rule, the mixture rule, and the contained-in interpretation to identify correctly whether a CERCLA substance is a RCRA hazardous waste. These three principles, as well as an introduction to the RCRA delisting process, are described below.

Derived-from Rule (40 CFR 261.3(c)(2))

The derived-from rule states that any solid waste derived from the treatment, storage, or disposal of a listed RCRA hazardous waste is itself a listed hazardous waste (regardless of the concentration of hazardous constituents). For example, ash and scrubber water from the incineration of a listed waste are hazardous wastes on the basis of the derived-from rule. Solid wastes derived from a characteristic hazardous waste are hazardous wastes only if they exhibit a characteristic.

Mixture Rule (40 CFR 261.3(a)(2))

Under the mixture rule, when any solid waste and a listed hazardous waste are mixed, the entire mixture is a listed hazardous waste. For example, if a generator mixes a drum of listed F006 electroplating waste with a non-hazardous wastewater (wastewaters are solid wastes - see Highlight 3), the entire mixture of the F006 and wastewater is a listed hazardous waste.

Mixtures of solid wastes and characteristic hazardous wastes are hazardous only if the mixture exhibits a characteristic.

Contained-in Interpretation (OSW Memorandum dated November 13, 1986)

The contained-in interpretation states that any mixture of a non-solid waste and a RCRA listed hazardous waste must be managed as a hazardous waste as long as the material contains (i.e., is above health-based levels) the listed hazardous waste. For example, if soil or ground water (i.e., both non-solid wastes) contain an F001 spent solvent, that soil or ground water must be managed as a RCRA hazardous waste, as long as it "contains" the F001 spent solvent.

Delisting (40 CFR 260.20 and 22)

To be exempted from the RCRA hazardous waste "system," a listed hazardous waste, a mixture of a listed and solid waste, or a derived-from waste must be delisted (according to 40 CFR 260.20 and 22). Characteristic hazardous wastes never need to be delisted, but can be treated to no longer exhibit the characteristic. A contained-in waste also does not have to be delisted; it only has to "no longer contain" the hazardous waste.

If site managers determine that the hazardous substance(s) at the site is a RCRA hazardous waste(s), they should also determine whether that RCRA waste is a California list waste. California list wastes are a distinct category of RCRA wastes restricted under the LDRs (see Superfund LDR Guide #2).

(3) IS THE RCRA WASTE RESTRICTED UNDER THE LDRs?

If a site manager determines that a CERCLA waste is a RCRA hazardous waste, this waste also must be restricted for the LDRs to be an applicable requirement. A RCRA hazardous waste becomes a restricted waste on its HSWA statutory deadline or sooner if the Agency promulgates a standard before the deadline. Because the LDRs are being phased in over a period of time (see Highlight 4), site managers may need to determine what type of restriction is in

Highlight 4: LDR STATUTORY DEADLINES

Waste	Statutory Deadline
Spent Solvent and Dioxin-Containing Wastes	November 8, 1986
California List Wastes	July 8, 1987
First Third Wastes	August 8, 1988
Spent Solvent, Dioxin-Containing, and California List Soil and Debris From CERCLA/RCRA Corrective Actions	November 8, 1988
Second Third Wastes	June 8, 1989
Third Third Wastes	May 8, 1990
Newly Identified Wastes	Within 6 months of identification as a hazardous waste

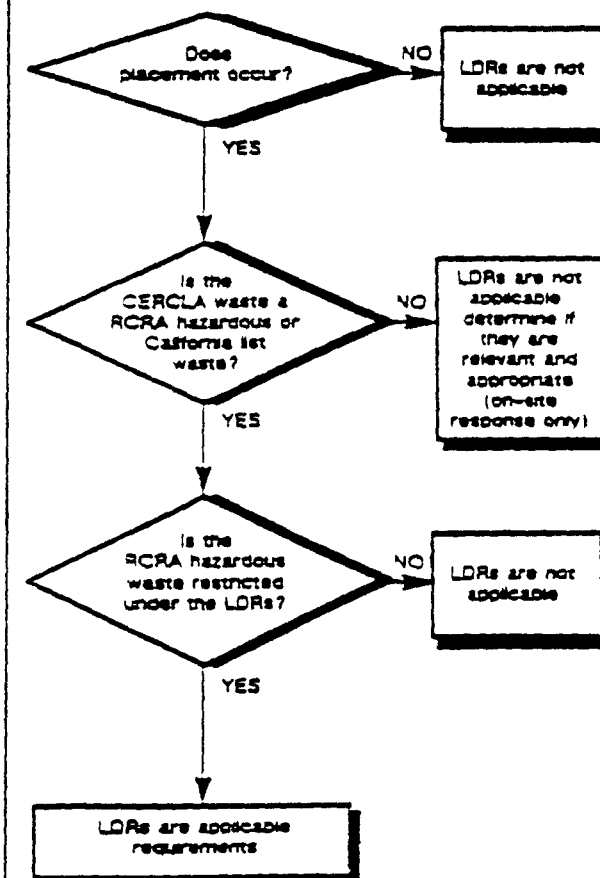
effect at the time placement is to occur. For example, if the RCRA hazardous wastes at a site are currently under a national capacity extension when the CERCLA decision document is signed, site managers should evaluate whether the response action will be completed before the extension expires. If these wastes are disposed of in surface impoundments or landfills prior to the expiration of the extension, the receiving unit would have to meet minimum technology requirements, but the wastes would not have to be treated to meet the LDR treatment standards.

APPLICABILITY DETERMINATIONS

If the site manager determines that the LDRs are applicable to the CERCLA response based on the previous three questions, the site manager must (1)

comply with the LDR restriction in effect, (2) comply with the LDRs by choosing one of the LDR compliance options (e.g., Treatability Variance, No Migration Petition), or (3) invoke an ARAR waiver (available only for on-site actions). If the LDRs are determined not to be applicable, then, for on-site actions only, the site manager should determine if the LDRs are relevant and appropriate. The process for determining whether the LDRs are applicable to a CERCLA action is summarized in Highlight 5.

Highlight 5 - DETERMINING WHEN LDRS ARE APPLICABLE REQUIREMENTS





A Guide to Delisting of RCRA Wastes for Superfund Remedial Responses

Attachment 2
LG-001-95
Page 5 of 10

Office of Emergency and Remedial Response
Hazardous Site Control Division OS-220

Quick Reference Fact Sheet

On-site CERCLA remedial response actions must comply with the substantive requirements of the Resource Conservation and Recovery Act (RCRA) when they are determined to be applicable or relevant and appropriate requirements (ARARs). RCRA requirements are applicable for CERCLA responses involving the treatment, storage, or disposal of RCRA wastes (or when disposal of the waste being addressed under CERCLA occurred after November 19, 1980). Delisting a RCRA waste (and thus removing it from regulation under RCRA Subtitle C) is one option available to site managers for addressing wastes or treatment residuals containing hazardous constituents in low concentrations (i.e., at or near health-based levels). This guide discusses the circumstances under which delisting wastes may be appropriate and the procedures for delisting a RCRA hazardous waste as part of a Superfund remedial response. (For additional information, please see Provisions to Delist Hazardous Wastes: A Guidance Manual (Office of Solid Waste and Emergency Response, April 1985 EPA/530-SW-85-003).)

BACKGROUND

There are two types of RCRA waste that are subject to RCRA Subtitle C hazardous waste requirements: listed and characteristic. Listed wastes are regulated under Subtitle C until they have been delisted, at which time they may be disposed of in a Subtitle D facility. Delisting requires a demonstration that a listed RCRA hazardous waste, or a mixture containing listed hazardous wastes, no longer meets any of the criteria under which the waste was listed and no other factors are known that would make the waste hazardous. Delisting applies only to listed wastes, mixtures containing listed wastes, or residuals derived from treatment of a listed waste. Characteristic hazardous wastes do not have to be delisted in order to be eligible for management in a Subtitle D facility, but may simply be rendered "non-characteristic" (i.e., treated to no longer exhibit any of the characteristics outlined in 40 CFR Part 261, Subpart C), or meet the Land Disposal Restriction (LDR) treatment standards.

For on-site CERCLA remedial response actions, delisting of RCRA wastes is accomplished by incorporating the substantive requirements of 40 CFR 260.20 and .22 into the remedial process. For off-site CERCLA response actions, the administrative requirements of 40 CFR 260.20 and .22 must also be met.

WHEN TO CONSIDER DELISTING

Site managers may want to consider delisting when planning CERCLA response actions that will address materials contaminated with RCRA listed waste in low concentrations (including treatment residuals that, despite treatment, remain listed wastes under the derived-from rule

[40 CFR 261.3(c)(2)]). If site managers believe that these materials pose no significant threat to ground water and that management in a Subtitle D solid waste disposal facility (to prevent direct contact) would be fully protective of human health and the environment, delisting as a potential option should be evaluated. Unless listed wastes can be delisted, management of these materials must be in accordance with Subtitle C (i.e., clean closure or landfill closure with an impermeable cap, or a hybrid closure where RCRA closure requirements are relevant and appropriate).

BASIS FOR DELISTING

Under RCRA, once sufficient data are collected on the waste, and its potential fate and transport, models (see Highlight 1) are run to evaluate the dilution and attenuation of constituents at a hypothetical receptor well. The calculated concentrations of constituents at the hypothetical receptor well must at least meet the health-based levels used for delisting decisions for the waste to be successfully delisted (Table 1, inserted in this fact sheet, contains the maximum allowed concentrations (MACs) for specific constituents based on the current health-based levels (10^{-6} risk) developed by the Office of Solid Waste for delisting decisions.)

During site characterization and the development of the baseline risk assessment, if analyses indicate that minimal risks are posed by identified RCRA listed wastes, (i.e., they are already at or near delisting levels) site managers should consider management options involving the delisting of wastes. Delisting evaluations should be made early in the RI/FS process, thus allowing the requirements and disposal options associated with delisting to be factored into the detailed analysis of remedial alternatives. For delistings at CERCLA sites OERR recommends that site managers use the same

Highlight 1 MODELS USED BY THE OFFICE OF SOLID WASTE TO JUSTIFY DELISTING PETITIONS

The recently promulgated toxicity characteristic leaching procedure (TCLP) is used to measure the leaching potential of selected inorganic and organic constituents (55 FR 11798, March 29, 1990). For some organics, the Organic Leachate Model (OLM) (see 51 FR 41084-100, November 13, 1986) may be used to estimate the leaching potential of these constituents. The OLM is based on data from leaching tests performed on wastes with organics. Data generated from the TCLP (and possibly the OLM) are used in the appropriate models to determine whether the waste will pose a threat to human health and the environment.

EPA uses an appropriate model, such as the VHS model, to estimate the ability of an aquifer to dilute the leachate toxicants and predict toxicant levels at a receptor well. (See 50 FR 48846, November 27, 1985 for a complete description of the VHS model.) The predicted levels of toxicants from the VHS model are then compared to health-based levels used in delisting decision-making (e.g., MCLs, RfDs) for those compounds, in an effort to evaluate hazard potential.

analytical tests and models as the Office of Solid Waste to analyze and predict the potential fate and transport of waste constituents and to substantiate a delisting request.

In certain cases, pathways other than ground water may present a greater concern, or site conditions are such that use of other or additional models (e.g., air models, 51 FR 41084, November 13, 1986) may be appropriate. Because the delisting determination is waste-specific, site managers should document why a particular model is being used.

If results from treatability studies conducted during an RI/FS indicate that treatment will attain delisting levels, these data may serve as the basis for approving a delisting demonstration. When site-specific treatability study data are not available, data from the application of technologies to similar wastes may be used to assess the likely effectiveness of the treatment processes and to demonstrate that a particular waste would be rendered non-hazardous and justify a delisting. If there are technically sound reasons to believe that delisting levels can be attained, site managers still may seek to delist the wastes but should specify another option for disposal of the material (i.e., Subtitle C disposal) if delistable levels are not attained.

As outlined in the NCP (55 FR 8756, March 8, 1990), only the substantive requirements of delisting must be met for on-site CERCLA responses. The delisting may be granted when the Regional Administrator signs the ROD. For off-site actions, the Office of Solid Waste and Emergency Response (Contact: Assistance Branch (OS-343) 382-4206) makes delisting decisions. The formal RCRA administrative process for delisting would not apply, however, to non-contiguous CERCLA facilities meeting the criteria to be treated as one site and to which the on-site permit exemption extends (see NCP, 55 FR 8690-1, March 8, 1990).

DEMONSTRATING COMPLIANCE

Verification testing may be required following treatment of the wastes to confirm that delisting levels are attained. Verification testing may require collection of samples generated from treatment systems, analysis of samples for total and TCLP leachate concentrations of inorganic and organic constituents and any other RCRA characteristics (as

appropriate)¹; and analysis of any other information relevant to the delisting that may not have been anticipated at the time that the original decision document was signed. The specific demonstrations required may vary based on process- or waste-specific conditions at the site. [NOTE: An appropriate testing frequency of treatment residuals will need to be established during the design phase for a period long enough to represent the variability of the delisted material.] All data from verification testing must be collected using the appropriate QA/QC procedures (such as those contained in the site's Quality Assurance Project Plan (QAPP) prepared during the RI/FS scoping or remedial design process).

Waste to be delisted must be managed as hazardous until it has been analyzed in accordance with the sampling and analysis requirements established at the time of delisting, and it has been determined that delisting levels have been attained. Therefore, temporary storage of waste residuals will be necessary in some cases until sampling results are received. RCRA storage requirements that are ARAR must be met (or a waiver justified) during this period for remedial actions.

DOCUMENTING A WASTE DELISTING

Although compliance with the RCRA administrative delisting requirements are not required as part of an on-site CERCLA remedial response, compliance with the substantive requirements of delisting must be documented in the appropriate CERCLA documents. Since off-site CERCLA responses must comply with both substantive and administrative requirements, site managers must follow the formal delisting petition process (40 CFR 260.20 and .22) when hazardous wastes or waste residuals are to be delisted for management off-site. This includes Office of Solid Waste review, or State review for those States that have adopted the delisting program at least equivalent to the Federal program publication of a proposed notice in the Federal Register, an opportunity for public comment, and publication of the final rule in the Federal Register. The Office of Solid Waste's goal

¹Note that for any responses expected to take place prior to the TCLP effective date, the EP Toxicity test may apply.

Table 1 Maximum

in water concentrations

Maximum allowed concentrations (MACs) are back calculated from the VHS model using a minimum waste volume of 8000 cubic yards. If lower waste volumes will result in higher MACs, if the waste contains <0.5% solids then the leaching procedures cannot be performed. In that case the total constituent concentrations should be compared to the MACs. These MACs represent the maximum concentrations below which a constituent would pass the VHS model and thus the waste would be considered a candidate for delisting. These MACs are to be used only as guidance for delisting, not for cleanup levels.

The MACs listed here are based on use of the VHS model and the current health based levels used for delisting decision-making. If a different model is used and/or if a health based level changes then the calculated MAC will also change. The MACs listed here for organic constituents are based on OLM leachate values. In the near future, petitioners may be required to measure organic constituent leaching using the TCLP. (Thus TCLP leachate data will replace OLM calculated data in the VHS model.) Therefore, the TCLP is used in place of the OLM for organic constituents; then the TCLP leachate value would be compared to the MAC level listed in the table for liquids.

The numbers shown in the table are given in exponential form. The notation $XE+YY$ is equivalent to $X \times 10^{YY}$. For example, $5.170E+02$ is equivalent to 5.170×10^2 or 517.0. $3.785E-04$ is equivalent to 3.785×10^{-4} or 0.0003785.

Chemical	MAC for Solids (ppm)	MAC for Liquids (mg/L)	Chemical	MAC for Solids (ppm)	MAC for Liquids (mg/L)	Chemical	MAC for Solids (ppm)	MAC for Liquids (mg/L)
Acetone	5.170E+02	2.824E+01	2-sec-Butyl-4-6-dinitrophenol	1.348E+02	2.824E-01	1,2-Dichlorobenzene	4.800E+03	3.785E+00
Acetonitrile	8.231E+00	1.262E+00	Octadecane	8.309E-02	8.309E-01	1,3-Dichlorobenzene	4.790E+04	1.893E+00
Acetophenone	9.049E+03	2.824E+01	Carbon disulfide	1.277E+04	2.824E+01	1,4-Dichlorobenzene	2.880E+02	4.732E-01
Acrolein	1.181E+00	3.15E+00	Carbon tetrachloride	1.408E+00	3.15E-02	3,3-Dichlorobenzidine	6.050E-02	5.047E-04
Acrylamide	Treat Tech	Treat Tech	Chloral	2.840E+00	4.410E-01	Dichlorodifluoromethane	1.003E+08	4.410E+01
Acrylic Acid	3.382E+02	1.893E+01	Chloroform	1.824E+01	1.824E-02	1,1-Dichloroethane	1.140E-02	2.824E-03
Acrylonitrile	3.78E-04	3.785E-04	p-Chloraniline	4.741E+01	8.309E-01	1,2-Dichloroethane	3.717E-01	3.188E-02
Aldicarb	1.253E+00	8.309E-02	Chlorobenzene	1.826E+02	8.309E-01	1,1-Dichloroethylene	1.270E+00	4.410E-02
Aldrin	1.381E-03	1.262E-04	Chlorobenzonitrile	4.312E+02	4.410E+00	cis-1,2-Dichloroethylene	2.873E+01	4.410E-01
Allyl Alcohol	8.025E+00	1.262E+00	p-Chloro-m-cresol	1.327E+02	1.262E+00	trans-1,2-Dichloroethylene	3.641E+01	8.309E-01
Aluminum Phosphide	8.309E-02	8.309E-02	Chlorodibromomethane	7.826E+02	4.410E+00	Dichloromethane	2.324E-01	3.188E-02
Aniline	2.230E-01	3.785E-02	Chloroform	4.806E-01	3.785E-02	2,4-Dichlorophenol	4.329E+01	8.309E-01
Anthracene	7.701E+01	1.262E-02	Chloromethyl methyl ether	Decomposes	2.824E-06	1,3-Dichloropropane	8.882E-01	3.188E-02
Antimony	8.309E-02	8.309E-02	2-Chlorophenol	4.412E+01	1.262E+00	1,3-Dichloropropane	5.640E-03	1.262E-03
Arsenite	2.188E-01	3.188E-01	Chromium	3.165E-01	3.165E-01	Dieldrin	1.262E-03	1.262E-06
Barium	8.309E+00	8.309E+00	Dibenzene	1.810E+01	1.262E-03	Diethyl phthalate	4.785E+06	1.893E+02
Benzene	8.798E-01	3.188E-02	Cresols	1.267E+03	1.262E+01	Diphenoxide	2.277E-01	4.410E-02
Benzidine	1.262E-04	1.262E-06	Dyphide	4.418E+00	4.418E+00	7,12-Dimethylbenzophenanthrene	3.743E-03	8.309E-06
Benzophenone	8.880E-02	8.309E-06	Cyanogen	1.436E+02	8.309E+00	2,4-Dimethylphenol	1.248E+01	1.262E-01
Benzophenylene	3.877E-02	1.893E-05	Dyphogen bromide	1.883E+01	1.883E+01	2,6-Dimethylphenol	2.820E-01	1.262E-02
Benzophenylene	1.843E-01	1.262E-04	2,4-Dichlorophenoxyacetic acid (2,4-D)	1.000E+02	8.309E-01	3,4-Dimethylphenol	1.224E+01	2.824E-02
Benzophenylene	7.780E+02	2.824E-02	DDD	8.882E-01	8.309E-04	Dimethyl phthalate	9.232E+06	2.824E+03
Benzyl chloride	8.432E-03	1.262E-03	DDE	8.882E-01	8.309E-04	Dinitrobenzene (meta)	1.317E+00	2.824E-02
Bis(2-chloroethoxy)ether	1.893E-04	1.893E-04	DDT	3.189E+00	8.309E-04	4,6-Dinitro-o-cresol	6.127E+01	2.824E-01
Bis(2-chloroisopropyl)ether	2.234E+03	8.309E+00	Dibenz(a,h)acridine	6.554E-02	1.893E-05	2,4-Dinitrophenol	2.280E+01	4.410E-01
Bis(2-ethoxyethyl)phthalate	4.210E+01	1.893E-02	Dibenz(a,h)anthracene	7.318E-03	4.410E-06	Dinitrobenzene	1.184E-03	3.155E-04
Bromodichloromethane	7.548E+02	4.410E+00	1,2-Dibromo-3-chloropropan	1.048E-02	1.262E-03	Di-n-octyl phthalate	3.441E+04	3.785E+00
Bromomethane	3.808E+01	3.155E-01	Di-n-butyl phthalate	2.821E+05	2.824E+01	1,4-Dioxane	2.021E-02	1.893E-02
Butyl benzyl phthalate	8.378E+04	8.078E+00				Diphenylamine	1.232E+04	8.078E+00

Table 1 Maximum Allowed Concentrations (cont.)

Chemical	MAC for Solids (ppm)	MAC for Liquids (mg/L)	Chemical	MAC for Solids (ppm)	MAC for Liquids (mg/L)	Chemical	MAC for Solids (ppm)	MAC for Liquids (mg/L)
1,2-Diphenylhydrazine	0.070E-04	2.524E-04	Methomyl	2.740E-02	5.078E+00	Selenourea	No Solubility	1.202E+00
Diazinon	0.001E-01	0.300E-03	Methoxychlor	2.033E+04	0.300E-01	Silver	3.155E-01	3.155E-01
Endosulfan	1.003E+01	1.202E-02	Methyl chloride	0.250E+03	2.524E+01	Strychnine and salts	0.332E+00	0.300E-02
Endrin	1.004E+00	1.202E-03	Methyl chloroacetate	1.543E+04	2.524E+02	Styrene	2.343E+00	3.155E-02
Epichlorohydrin			Methyl ethyl ketone	3.039E+02	1.202E+01	1,2,4,5-Tetrachlorobenzene	5.003E+01	0.300E-02
(1-Chloro-2,3-epoxycyclohexane)	Treat Tech	Treat Tech	Methyl isobutyl ketone	1.041E+03	1.202E+01	1,1,2,2-Tetrachloroethane	5.032E-03	1.202E-03
Ethyl benzene	4.004E+03	4.410E+00	Methyl methacrylate	1.301E+03	1.003E+01	Tetrachloroethylene	3.430E+00	3.155E-02
Ethyl ether	2.504E+04	1.202E+02	Methyl parathion	1.351E+01	5.078E-02	2,3,4,6-Tetrachlorophenol	2.002E+03	0.300E+00
Ethylene dibromide	0.070E-04	3.155E-04	Naphthalene	5.730E+05	0.300E+01	Tetraethyl dithiopyrophosphate	0.426E+01	1.202E-01
Ethylene oxide	0.300E-04	0.300E-04	Nickel	Under consideration by EPA		Tetraethyl lead	1.052E-03	2.524E-05
Fluoranthene	2.071E+04	1.202E+00	Nitric oxide	2.524E+01	2.524E+01	Thallium	1.003E-02	1.003E-02
Fluorene	1.040E+01	1.202E-02	Nitrobenzene	0.557E+00	1.202E-01	Thiourea	1.202E-04	1.202E-04
Formic Acid	3.033E+04	4.410E+02	Nitrogen dioxide	2.524E+02	2.524E+02	Thiram	1.010E+03	1.202E+00
Glycidylaldehyde	7.510E-02	0.300E-02	N-Nitroso-di-n-butylamine	2.000E-05	3.705E-05	Toluene	1.170E+04	1.202E+01
Heptachlor	3.345E+00	2.524E-03	N-Nitrosodimethylamine	0.300E-05	0.300E-05	Toluene-2,6-diamine	2.000E+03	3.705E+01
Heptachlor epoxide (alpha)			N-Nitrosodimethylamine	1.202E-00	1.202E-00	Toraphene	7.000E+01	3.155E-02
beta gamma isomer)	0.340E-01	1.202E-03	N-Nitrosodimethylamine	5.011E-00	4.410E-00	2,4,5-TP (Silvex)	0.005E+00	0.300E-02
Hexachlorobenzene	2.010E-01	1.202E-04	N-Nitrosodiphenylamine	1.000E+01	4.410E-02	Trichloromethane (Bromoform)	0.040E+02	4.410E+00
Hexachlorobutadiene	5.130E+00	3.155E-03	N-Nitroso n-propylamine	3.155E-05	3.155E-05	1,2,4-Trichlorobenzene	1.217E+04	4.410E+00
Hexachlorocyclopentadiene	0.203E+03	1.202E+00	Nitrooxyproline	1.202E-04	1.202E-04	1,1,1-Trichloroethane	2.220E+02	1.202E+00
Hexachloroethane	2.050E+00	1.003E-02	Pentachlorobenzene	2.204E+03	1.003E-01	1,1,2-Trichloroethane	2.310E-02	3.705E-03
Hexachlorophene	3.181E+03	0.300E-02	Pentachloronitrobenzene	7.210E-01	0.300E-04	Trichloroethylene	1.140E+00	3.155E-02
Hydrazine	0.300E-05	0.300E-05	Pentachlorophenol	2.017E+03	1.202E+00	Trichlorofluoromethane	0.474E+04	0.300E+01
Hydrocyanic acid (hydrogen cyanide)	4.410E+00	4.410E+00	Phenanthrene	1.300E+01	1.202E-02	2,4,5-Trichlorophenol	2.101E+04	2.524E+01
Hydrogen sulfide	0.300E-01	0.300E-01	Phenol	2.051E+04	1.202E+02	2,4,6-Trichlorophenol	3.530E-01	1.202E-02
Indeno(1,2,3-cd)pyrene	2.070E+01	1.202E-03	m-Phenylenediamine	1.100E+01	1.202E+00	2,4,6-Trichlorophenoxycetic	1.000E+03	2.524E+00
Isobutanol	0.244E+03	0.300E+01	Phenyl mercury acetate	4.200E-01	1.003E-02	1,2,3-Trichloropropane	1.300E+02	1.202E+00
Isophorone	1.345E+04	4.410E+01	Phosphine	5.003E+00	0.300E-02	1,1,2-Trichloro-1,2,2-tri-		
Lead	Under consideration by EPA		Phthalic anhydride	5.700E+05	4.410E+02	Fluoroethane	1.002E+00	0.300E+03
Lindane	1.013E-01	1.202E-03	Polychlorinated biphenyls	1.223E+01	3.155E-03	sym-Trinitrobenzene	5.572E-01	1.202E-02
Maleic anhydride	Soluble	2.524E+01	Pronamide	5.450E+04	1.003E+01	2,4,6-Trinitrotoluene	3.003E-01	0.300E-03
Maleic hydrazide	0.203E+04	1.202E+02	Pyrene	4.070E+05	0.300E+00	Vanadium pentoxide	4.410E+00	4.410E+00
Mercury	1.202E-02	1.202E-02	Pyridine	3.304E+00	2.524E-01	Vinyl chloride	1.022E-01	1.202E-02
Methacrylonitrile	1.470E-01	2.524E-02	Selenious acid	0.300E-01	0.300E-01	Warfarin	3.150E+01	0.300E-02
Methyl	5.552E+03	1.202E+02	Selenium	0.300E-02	0.300E-02	Xylene (mixed)	2.177E+05	0.300E+01

is to propose and finalize delistings within 24 months from the time a complete petition is received.

RI/FS Report

The substantive requirements for delisting a RCRA hazardous waste should be documented in the RI/FS Report. In the Detailed Analysis of Alternatives chapter of the FS Report, a general discussion of why delisting is warranted should be included in the description of each alternative for which a delisting is contemplated. Where the remedial alternatives involving treatment are expected to result in a residual that may be delisted, this discussion should also specify the concentrations of each waste constituent expected to remain after treatment. The specific information that should be included in an RI/FS report for on-site and off-site CERCLA remedial actions is presented in Highlight 2. (The more specific and detailed information, such as relevant waste analysis data from sampling, should be placed in an appendix to the report.) Under the "Compliance with ARARs" Criterion, as part of the Description of Alternatives section, site managers should identify those wastes or waste residuals to be delisted, and managed under Subtitle D instead of Subtitle C.

Proposed Plan

The intent to delist wastes should be stated in the Description of Alternatives section of the Proposed Plan. Because the Proposed Plan solicits public comment on all of the remedial alternatives, and not just the preferred option the intent to delist wastes on-site or to obtain a delisting petition for off-site wastes should be identified for all alternatives for which such an approach is planned. This opportunity for public comment on the Proposed Plan fulfills the requirements for public notice and comment on delisting petitions required under 40 CFR 260.20(d). Highlight 3 provides sample language for the Proposed Plan.

Record of Decision

Sample language for the Description of Alternatives section of the ROD is shown in Highlight 4. The documentation provided in the ROD should be a brief synopsis of the information in the FS report. In the Description of Alternatives section, as part of the discussion of major ARARs for each remedial alternative, site managers should include a statement (as was done in the FS report) that explains why delisting is justified. A statement should

Highlight 2 - DOCUMENTATION FOR RI/FS REPORT FOR DELISTING (Detailed Analysis of Alternatives Chapter)

ON-SITE

- Description of Remedial Alternatives
- Detailed Description of the Treatment Process being used to render the waste non-hazardous (e.g., operating parameters)
- Waste and Treatment Residual Characterization
 - EPA Hazardous Waste Number(s)
 - Complete Description of the Waste (e.g., matrix, percent solids, pH)
 - Waste Management Information (e.g., current and proposed management techniques, flow diagrams)
 - Description of Constituents present (identification, concentrations)
- Relevant Sampling and Testing Information¹ (e.g., TCLP test results)
- Data on Representative Samples for the Listed Constituents and a Discussion of Why the Waste is Non-Hazardous. Include a statement that the samples are representative of constituent concentrations in the waste, and discuss modelling results.
- CERCLA on-site response actions need not meet administrative procedures of other environmental statutes. The RI/FS and ROD process are substitutes for the administrative procedures in the delisting process. The substantive requirements remain the same (55 FR 8756 -57, March 8, 1990).

OFF-SITE (In addition to elements required for off-site petition)

For off-site delisting petitions, the documentation requirements listed for on-site actions should be extracted from the RI/FS report and combined with the following information found below. The information should be incorporated with the on-site information into a 40 CFR 260.20 petition and a copy of the petition should be referenced and attached to the RI/FS report.

Petitioner's name and address
Identification of on-site contact person, if different from above
Description and location of site
Statement of the petitioner's interest in the proposed action

¹ Appropriate sampling information may be contained in the Superfund Quality Assurance Project Plan (QAPP) and, therefore, not specifically repeated in the RI/FS Report. Where appropriate, however, information on relevant sampling procedures should be referenced in this section when discussing the basis for delisting.

Highlight 3: SAMPLE LANGUAGE FOR THE PROPOSED PLAN

Description of Alternatives section:

Under this alternative, the [waste/treatment residuals] will be delisted (i.e., shown to be non-hazardous wastes) and thus will no longer be subject to RCRA Subtitle C hazardous waste regulations. The [wastes/treatment residuals] will be managed in accordance with the RCRA Subtitle D (solid waste) requirements (and/or state solid waste disposal requirements).

Evaluation of Alternatives section, under "Compliance With ARARs"

The [wastes/treatment residuals] will be delisted in [Enter number] of [Enter total number of alternatives]. The RCRA Subtitle D (solid waste) closure requirements, rather than Subtitle C requirements, will be ARARs for these [wastes/treatment residuals].

Community's Role in Selection Process:

The Proposed Plan seeks comment on the delisting of the [waste/treatment residuals and models] for each alternative for which delisting is proposed.

also be included explaining that the waste was delisted under CERCLA, therefore RCRA's substantive requirements have been met.

In the Statutory Determinations section, under the "Compliance with ARARs" finding, site managers should indicate that the wastes will be delisted.

Unless treatability studies conducted in the RI/FS indicate that a technology's performance is reasonably certain, the ROD should address how to handle wastes that do not achieve delistable levels. If waste residuals cannot be delisted, a contingency plan will be implemented. Where the contingency implemented differs significantly from that

Highlight 4: SAMPLE LANGUAGE FOR THE RECORD OF DECISION

Description of Alternatives section:

Because existing and available data and the results of modeling demonstrate that the [waste/treatment residuals] will not be hazardous (i.e., do not contain hazardous constituents in levels that are hazardous and do not exhibit a hazardous characteristic), they will be delisted. Therefore, the RCRA Subtitle C requirements are not ARARs. These [wastes/treatment residuals], however, will be managed as solid wastes under RCRA Subtitle D [and State of {name} solid waste disposal requirements under {citation}]. This delisting is justified on the basis of [results from treatability testing/other basis]. This delisting satisfies the substantive requirements of 40 CFR 260.20 and .22.

If testing of the waste during the remedial action shows that the necessary levels are not being attained for delisting these wastes, they will be managed as Subtitle C hazardous wastes and the applicable or relevant and appropriate requirements under Subtitle C will be met.

discussed in the ROD, the ROD must be amended or an Explanation of Significant Differences (ESD) issued (NCP §300.435(c)(2)). Where the contingency implemented does not significantly differ from that discussed in the ROD, it may be advisable to issue an ESD or fact sheet to inform the public of these actions.

The Comparative Analysis section of the ROD should discuss contingent remedies in a level of detail that is adequate to explain the contingency (so that the public has an ample opportunity to review the contingency). The Selected Remedy section should establish the parameters of both the selected and contingent remedies and provide the criteria by which the contingency remedy would be implemented. The Statutory Determinations section should demonstrate how either remedy would fulfill CERCLA section 121 requirements.

NOTICE. The policies set out in this memorandum are intended solely as guidance. They are not intended, nor can they be relied upon to create any rights enforceable by any party in litigation with the United States. EPA officials may decide to follow the guidance provided in this memorandum, or to act at variance with the guidance, based on an analysis of specific site circumstances. The Agency also reserves the right to change this guidance any time without public notice.